L19: Entry 1 of 1 File: USPT Mar 16, 2004

DOCUMENT-IDENTIFIER: US 6708161 B2
TITLE: System and method for selective database indexing

Detailed Description Text (6):
Alternatively, multiple sellers 30 may be grouped in an electronic marketplace according to the products they provide and a buyer 20 may search the offerings of the multiple sellers 30 at a single web site. However, if buyer 20 wishes to obtain several different types of products, then buyer 20 may have to go to several different types of marketplaces. Furthermore, there may be numerous competing marketplaces that buyer 20 has to search to perform the discovery phase of a transaction for a particular product. One potential method of addressing this problem is to create a global product database that potentially includes data identifying the features of all the products that any buyer may wish to obtain. Therefore, the global database would include the combined contents of every database 32 associated with every seller 30. However, such a global database would have many problems. For example, the sheer size of the database would make it difficult to search and thus the database would suffer from performance problems. In addition, it would be difficult to allow large numbers of buyers 20 to search the database at once. Furthermore, all sellers 30 would be required to access the global database to update their information and the entire database would have to be updated each time a change is made. Many other problems might also exist.

Detailed Description Text (44):
In addition to directing the migration of product data at a remote migration location, GCD 42 may also cache the results of frequent queries made by buyers 20 using GCD 42. Such results may include lists of products resulting from a buyer's search for products in a particular class. As described above, GCD 42 may generate these product lists (which may include a GUID 100 and an RID associated with each product) based on queries of the databases 32 identified by pointers associated with a particular class in GCD 42. Therefore, if GCD 42 caches frequently performed queries, then GCD 42 may not have to perform such queries each time a buyer 20 makes a search request. Instead, GCD 42 may display the cached search results. Any appropriate caching technique may be used to store search results or the results of other queries performed by GCD 42. Furthermore, the cached search results may be updated using any appropriate techniques. For example, GCD 42 may perform a new query instead of using cached results once a selected amount of time has passed since the results were updated. Alternatively, a seller database 32 may inform GCD 42 when data communicated from database 32 in response to a GCD 42 query has been modified.

Refine Search

Search Results -

Terms	Documents
L6 and (search$ with interfac$) and ((search$ same quer$) same (product$ with class$))	0

Database:

- US Pre-Grant Publication Full-Text Database
- US Patents Full-Text Database
- US OCR Full-Text Database
- EPO Abstracts Database
- JPO Abstracts Database
- Derwent World Patents Index
- IBM Technical Disclosure Bulletins

Search: L11

Refine Search | Recall Text | Clear | Interrupt

Search History

DATE: Tuesday, October 18, 2005 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR			
L11	L6 and (search$ with interfac$) and ((search$ same quer$) same (product$ with class$))	0	L11
L10	L3 and (search$ with interfac$) and ((search$ same quer$) same (product$ with class$))	1	L10
L9	L6 and (product$ with class$)	3	L9
L8	L6 and ((search$ same interfac$) same (product$ with class$)) and ((search$ same quer$) same (product$ with class$))	0	L8
L7	L6 and ((search$ with interfac$) same (product$ with class$)) and ((search$ with quer$) same (product$ with class$))	0	L7
L6	6078891.pn. or 6578014.pn. or 6366910.pn.	3	L6
L5	L1 and ((search$ with interfac$) same (product$ with class$)) and ((search$ with quer$) same (product$ with class$))	1	L5
L4	L1 and (search$ with interfac$) and (search$ with quer$)	1	L4

L3	L2 and (search$ with interfac$) and (search$ with quer$)	1	L3
L2	L1 and (director$ with structure$)	1	L2
L1	6708161.pn.	1	L1

END OF SEARCH HISTORY

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Detailed Description Text (11):
However, as described above, product features (at least features that are more specific than the features defined by a class, as described below) are not typically stored in GCD 42, but are stored in databases 32. For example, a seller 30 may maintain a relational database 32 that includes a plurality of tables defining selected features of a variety of products. One or more pointers may be associated with each class to identify the location of one or more databases 32 that include product data for products contained in that class or to identify particular data products in databases 32. Therefore, GCD 42 may execute a search for products in databases 32 identified by a pointer corresponding to a user-selected class. GCD 42 may also return the network location (such as a uniform resource locator (URL) or other network address) of the database 32 to buyer 20 so that buyer 20 may independently access database 32. Databases 32 may be searched using any appropriate method including, but not limited to, a structured query language (SQL) query.

Detailed Description Text (12):
GCD 42 may be implemented using the lightweight directory access protocol (LDAP). LDAP enables directories to be provided using the tree-like structure described above. However, any other appropriate technique or protocol for creating GCD 42 may alternatively be used and GCD 42 may have any appropriate structure. Furthermore, GCD 42 may be an object-oriented directory (which is also provided by LDAP) such that each class in directory structure 44 includes the attributes of parent classes in which the class is a sub-class. Therefore, a product class listed at the end of a branch of the tree structure includes all of the attributes of its parent classes in the branch. Furthermore, each product included in a database 32 may be an object that includes all the attributes of the classes in which the product is included. Thus, when a search is performed from a class at the end of a branch of directory structure 44, the search query may automatically include any appropriate attributes of parent classes of the class.

Detailed Description Text (13):
For example, if a buyer 20 has navigated through directory structure 44 to felt-tip pens class 60b, a search performed by buyer 20 (or by GCD 42 on behalf of buyer 20) from felt-tip pens class 60b may automatically be limited to a search for felt-tip pens and buyer 20 may introduce additional desired search criteria (such as blue ink and medium tip). Therefore, if the database(s) 32 searched includes product data relating to a variety of writing utensils, a search of database 32 may be automatically limited by GCD 42 to only include felt-tip pens within that database 32. If a search including only the class attributes as the search criteria is not specific enough, buyer 20 may identify additional product features as additional search criteria.

Detailed Description Text (23):
Exemplary GUID 100 also includes PID 120 which is used to uniquely identify a

specific product that is included in the class identified by CID 110. Using the example above, PID 120 may identify a particular product in felt-tip pen class 60b. For example, PID 120 may identify a blue felt-tip pen having a medium tip and manufactured by a particular company. Therefore, since the classes of directory structure may not include all of the attributes of a particular product that may be needed to uniquely identify the product (for example, there are multiple types of felt-tip pens that may be included in felt-tip pen class 60b), PID 120 may be used to further identify a particular product in a class. Since each unique product in seller databases 32 may be an object of a class in GCD 42, PID 120 (combined with CID 110 to form GUID 100) can be used to uniquely identify any product included in databases 32.

Detailed Description Text (27):
GUID 100 may also include or be associated with a feature identifier (FID). As described above, a CID 110 and a PID 120 may be used to uniquely identify a product having a unique set of features. Some of these features are defined by the attributes of the classes of GCD 42 in which the product is included, but other features are defined in a database 32 and may be identified as a unique grouping of features by a PID 120 (however, two products in a database 32 may have identical features listed in database 32 but different PIDs, since the difference between the products may be associated with features not included in database 32 or may be simply a difference in the PID assigned by the manufacturer for the same product). One or more of the group of features identified by a PID may be individually identified using an FID. For example, if a buyer 20 wants to identify the color of ink in a particular pen (the pen identified using a CID 110 and PID 120), then the buyer 20 may do so by including the FID associated with ink color with the CID 110 and PID 120 in a search. The search results may then include the color of the ink that is used in the identified product. Alternatively, an FID may be used to specify a particular feature (such a blue ink) as a search criteria when searching for a product (such as felt-tip pens).

Detailed Description Text (29):
In an exemplary transaction, a buyer 20 may access a GCD interface 43 and perform a search of global content directory 42. GCD interface 43 may allow buyer 20 to both navigate or "browse" the classes of GCD 42 and to search for a particular class or classes. For example, buyer 20 may either navigate GCD 42 to find a class into which pens are categorized or buyer 20 may search GCD 42 for class names including the word "pen." Any other suitable methods for identifying a particular class may also be used. When buyer 20 has located the appropriate class for the product buyer 20 desires, buyer 20 may then request a listing of products in that class having certain features. For example, if buyer 20 is browsing felt-tip pens class 60b, buyer 20 may request all products in class 60b (felt-tip pens) that have red ink and a fine tip.

Detailed Description Text (31):
Based on the search terms provided by buyer (and possibly based on any appropriate attributes of the class from which the search is conducted), search interface 45 may communicate a query to the appropriate seller database(s) 32 requesting that databases 32 each return a listing of all products (including associated product data) that meet the search criteria. Databases 32 may also communicate product data relating to features of the matching products that were not included in the search criteria. For example, databases 32 may return a price and availability of a product that meets the search criteria even if the price and availability were not search criteria. The responses to the queries of databases 32 may be displayed to buyer 20 in any appropriate manner. For example, the products may be listed in order of relevance to the search criteria according to improved matching criteria as described in copending U.S. application Ser. No. 09/942,851 filed Dec. 20, 2000. Any other appropriate method of determining relevance may alternatively be used. Furthermore, GCD 42 may reorder the product listing based on a request from buyer 20. For example, buyer 20 may request that the matching products be listed in order

from least expensive to most expensive. Each product in listing may be associated with a GUID 100 and/or an RID.

Detailed Description Text (34):
In addition to providing a method of identifying products located using GCD 42, a GUID 100 may also be used in the physical world to identify products. Similarly, an RID may be used to identify the source of a particular product. Therefore, a GUID 100 may be used to replace a universal product code (UPC) that currently is used to identify a product. Unlike a UPC, however, a GUID 100 provides a much more flexible numbering scheme (for example, it may be expanded to accommodate the addition of an unlimited number of classes at any level in directory structure 44) and provides a definition of certain attributes of a product through its connection to the object-oriented class hierarchy of GCD 42. An RID may also be associated with (or be included in GUID 100) to provide the identity of the source of the product. Therefore, if a buyer 20 desires to purchase a product having a GUID 100 and RID, the GUID 100 and RID may be scanned or entered into a computer coupled to e-commerce system 10 (or coupled to sellers 30) to initiate a purchase of the product. For example, if a buyer 20 runs out of milk, buyer 20 may scan or enter in the GUID 100 and RID located on the empty milk jug and also enter in a unique identifier of the buyer 20. Based on the RID, the product request may be directed to the appropriate seller 30 and the seller may use a buyer identifier to charge buyer 20 for another milk jug and to ship the milk jug to the buyer 20. Any appropriate systems may be implemented to perform the functions necessary to complete such a transaction. A buyer 20 may also communicate a GUID 100 to GCD 42 to determine the RID of and/or other information about one or more sellers 30 that supply the product with the GUID 100. A GUID 100 and/or an RID also may be used in numerous other ways to streamline business transactions.

Detailed Description Text (44):
In addition to directing the migration of product data at a remote migration location, GCD 42 may also cache the results of frequent queries made by buyers 20 using GCD 42. Such results may include lists of products resulting from a buyer's search for products in a particular class. As described above, GCD 42 may generate these product lists (which may include a GUID 100 and an RID associated with each product) based on queries of the databases 32 identified by pointers associated with a particular class in GCD 42. Therefore, if GCD 42 caches frequently performed queries, then GCD 42 may not have to perform such queries each time a buyer 20 makes a search request. Instead, GCD 42 may display the cached search results. Any appropriate caching technique may be used to store search results or the results of other queries performed by GCD 42. Furthermore, the cached search results may be updated using any appropriate techniques. For example, GCD 42 may perform a new query instead of using cached results once a selected amount of time has passed since the results were updated. Alternatively, a seller database 32 may inform GCD 42 when data communicated from database 32 in response to a GCD 42 query has been modified.

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Detailed Description Text (11):
However, as described above, product features (at least features that are more specific than the features defined by a class, as described below) are not typically stored in GCD 42, but are stored in databases 32. For example, a seller 30 may maintain a relational database 32 that includes a plurality of tables defining selected features of a variety of products. One or more pointers may be associated with each class to identify the location of one or more databases 32 that include product data for products contained in that class or to identify particular data products in databases 32. Therefore, GCD 42 may execute a search for products in databases 32 identified by a pointer corresponding to a user-selected class. GCD 42 may also return the network location (such as a uniform resource locator (URL) or other network address) of the database 32 to buyer 20 so that buyer 20 may independently access database 32. Databases 32 may be searched using any appropriate method including, but not limited to, a structured query language (SQL) query.

Detailed Description Text (12):
GCD 42 may be implemented using the lightweight directory access protocol (LDAP). LDAP enables directories to be provided using the tree-like structure described above. However, any other appropriate technique or protocol for creating GCD 42 may alternatively be used and GCD 42 may have any appropriate structure. Furthermore, GCD 42 may be an object-oriented directory (which is also provided by LDAP) such that each class in directory structure 44 includes the attributes of parent classes in which the class is a sub-class. Therefore, a product class listed at the end of a branch of the tree structure includes all of the attributes of its parent classes in the branch. Furthermore, each product included in a database 32 may be an object that includes all the attributes of the classes in which the product is included. Thus, when a search is performed from a class at the end of a branch of directory structure 44, the search query may automatically include any appropriate attributes of parent classes of the class.

Detailed Description Text (29):
In an exemplary transaction, a buyer 20 may access a GCD interface 43 and perform a search of global content directory 42. GCD interface 43 may allow buyer 20 to both navigate or "browse" the classes of GCD 42 and to search for a particular class or classes. For example, buyer 20 may either navigate GCD 42 to find a class into which pens are categorized or buyer 20 may search GCD 42 for class names including the word "pen." Any other suitable methods for identifying a particular class may also be used. When buyer 20 has located the appropriate class for the product buyer 20 desires, buyer 20 may then request a listing of products in that class having certain features. For example, if buyer 20 is browsing felt-tip pens class 60b, buyer 20 may request all products in class 60b (felt-tip pens) that have red ink and a fine tip.

Detailed Description Text (31):

Based on the search terms provided by buyer (and possibly based on any appropriate attributes of the class from which the search is conducted), search interface 45 may communicate a query to the appropriate seller database(s) 32 requesting that databases 32 each return a listing of all products (including associated product data) that meet the search criteria. Databases 32 may also communicate product data relating to features of the matching products that were not included in the search criteria. For example, databases 32 may return a price and availability of a product that meets the search criteria even if the price and availability were not search criteria. The responses to the queries of databases 32 may be displayed to buyer 20 in any appropriate manner. For example, the products may be listed in order of relevance to the search criteria according to improved matching criteria as described in copending U.S. application Ser. No. 09/942,851 filed Dec. 20, 2000. Any other appropriate method of determining relevance may alternatively be used. Furthermore, GCD 42 may reorder the product listing based on a request from buyer 20. For example, buyer 20 may request that the matching products be listed in order from least expensive to most expensive. Each product in listing may be associated with a GUID 100 and/or an RID.

Detailed Description Text (44):
In addition to directing the migration of product data at a remote migration location, GCD 42 may also cache the results of frequent queries made by buyers 20 using GCD 42. Such results may include lists of products resulting from a buyer's search for products in a particular class. As described above, GCD 42 may generate these product lists (which may include a GUID 100 and an RID associated with each product) based on queries of the databases 32 identified by pointers associated with a particular class in GCD 42. Therefore, if GCD 42 caches frequently performed queries, then GCD 42 may not have to perform such queries each time a buyer 20 makes a search request. Instead, GCD 42 may display the cached search results. Any appropriate caching technique may be used to store search results or the results of other queries performed by GCD 42. Furthermore, the cached search results may be updated using any appropriate techniques. For example, GCD 42 may perform a new query instead of using cached results once a selected amount of time has passed since the results were updated. Alternatively, a seller database 32 may inform GCD 42 when data communicated from database 32 in response to a GCD 42 query has been modified.

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Brief Summary Text (8):
The systems and methods of the present invention provide a number of important technical advantages. Embodiments of the present invention provide a global content directory that provides access to data concerning vast numbers of products. Therefore, a buyer may search for a product using the global content directory and the need for the buyer to search numerous sellers to find the desired product is reduced or eliminated. The global content directory provides access to data concerning these numerous products using a directory structure that organizes products using a hierarchical, object-oriented classification system. A buyer may navigate or search the directory to find a particular classification of products and various information associated with the products within this classification, initiate a search of databases including data relating to a product, and then communicate with an appropriate database. This access to vast numbers of products is provided without the requirement that all data about the products be stored in a global database (which would greatly decrease performance). Instead the product data may be stored in seller databases that can be readily accessed from the global content directory. Furthermore, the global content directory may direct buyers to sellers so that so that once the buyer finds a desired product, a transaction for the product may be completed.

Brief Summary Text (9):
Certain embodiments of the present invention also provide a numbering system that is based on the hierarchical structure of the global content directory. This numbering system provides a globally unique identifier (GUID) for each product in the global content directory. This GUID may include elements that identify one or more hierarchical classifications of the global content directory in which a product is included and may be used to identify features of the product. In addition, a GUID (or an associated identifier) may be used to indicate the source of a product. Therefore, a buyer may use a GUID to identify a product and to request information or additional transactions from the source of the product.

Drawing Description Text (4):
FIG. 2 illustrates an exemplary directory structure of an exemplary global content directory;

Detailed Description Text (7):
A solution to the above problems, at least in part, is GCD 42. GCD 42 is a universal directory of the contents of multiple seller databases 32 (and potentially all seller databases 32). GCD 42 may be implemented using one or more servers 40 or other computers located at one or more locations. Most or all of the database content (such as product data, which may include an identifier of the product, descriptions of product features, information enabling a transaction relating to a product, or any other appropriate data or information) is stored in databases 32, but all of this content is accessible using GCD 42. Therefore, like the global database described above, GCD 42 provides buyers 20 with access to

product data relating to a multitude of products, but unlike the global database, GCD 42 does not attempt to store all of this product data in one enormous database. Instead, GCD 42 provides a directory of products using a directory structure in which products are organized using an hierarchical, object-oriented classification system (a "taxonomy"). A buyer 20 may navigate or search the directory to find a particular product and product data associated with the product. After a certain point of specificity, the product data associated with a product may actually be stored in and obtained by GCD 42 from a seller database 32. However, the requested product data may be transparently provided to buyer 20 such that all of the product data may appear to buyer 20 as being included in GCD 42.

Detailed Description Text (8):
FIG. 2 illustrates an exemplary directory structure 44 of an exemplary GCD 42. Products categorized in GCD 42 may be organized according to schemas. A schema may include the various classes into which a product is categorized (which may be referred to as "taxonomy") and the various features used to organize products in a particular class (which may be referred to as "ontology"). In exemplary directory structure 44, products may be organized and cataloged according to industry standard schemas 46 or other appropriate schemas, as described below. Within industry standard schemas 46, there are two exemplary classes: a direct materials class 48 and an indirect materials class 50. Each of these classes 48 and 50 includes several sub-classes which may themselves include sub-classes). Therefore, the numerous classes of directory structure 44 form a "tree-like" hierarchical structure into which products may be categorized.

Detailed Description Text (9):
For exemplary purposes, certain portions of directory structure 44 are "expanded" to show various levels of classes. The "level" of a class is indicated by the number of other classes between that a class and a root class (for example, industry standard schemas class 46). For example, indirect material class 50 is at the same level in directory structure as direct material class 48. Indirect material class 50 may include an office and computer supplies class 52, which includes a desk supplies class 54, which includes a writing utensils class 56. Furthermore, writing utensils class 56 includes a pens class 58, which includes numerous pen type classes 60a-60n ("n" indicating that any number of classes 60 may be included in pens class 58). Each of classes 50, 52, 54, 56, 58, and 60 is located at a different level of directory structure 44. A class at any level in directory structure may include one or more sub-classes, those sub-classes may include one or more sub-classes, and so on until a desired specificity of categorization is reached. A series of classes from a highest level class (the broadest class) to a lowest level class (the most specific class) may be referred to as a "branch" of directory structure 44. For example, classes 46, 48, 50, 52, 54, 56, 58, and 60b form one branch of directory structure 44.

Detailed Description Text (10):
A buyer 20 may navigate through directory structure 44 by expanding or collapsing various classes as desired. For example, FIG. 2 illustrates an expansion of certain classes of directory structure 44 to reach a felt-tip pen class 60b. Once a buyer 20 has navigated to a class that is specific enough for buyer 20 (and/or a class that is at the end of a branch), buyer 20 may then perform a search for products included in that class. For example, buyer 20 can search for all products in writing utensils class 56 that are blue felt-tip pins having medium tips. Alternatively, if buyer 20 navigates to the end of a branch of directory structure 44, such as felt-tip pen class 60b, GCD 42 may then enable buyer 20 to search for such pens that have blue ink and medium tips (which may reach the same result as the search above).

Detailed Description Text (12):
GCD 42 may be implemented using the lightweight directory access protocol (LDAP). LDAP enables directories to be provided using the tree-like structure described

above. However, any other appropriate technique or protocol for creating GCD 42 may alternatively be used and GCD 42 may have any appropriate structure. Furthermore, GCD 42 may be an object-oriented directory (which is also provided by LDAP) such that each class in directory structure 44 includes the attributes of parent classes in which the class is a sub-class. Therefore, a product class listed at the end of a branch of the tree structure includes all of the attributes of its parent classes in the branch. Furthermore, each product included in a database 32 may be an object that includes all the attributes of the classes in which the product is included. Thus, when a search is performed from a class at the end of a branch of directory structure 44, the search query may automatically include any appropriate attributes of parent classes of the class.

Detailed Description Text (13):
For example, if a buyer 20 has navigated through directory structure 44 to felt-tip pens class 60b, a search performed by buyer 20 (or by GCD 42 on behalf of buyer 20) from felt-tip pens class 60b may automatically be limited to a search for felt-tip pens and buyer 20 may introduce additional desired search criteria (such as blue ink and medium tip). Therefore, if the database(s) 32 searched includes product data relating to a variety of writing utensils, a search of database 32 may be automatically limited by GCD 42 to only include felt-tip pens within that database 32. If a search including only the class attributes as the search criteria is not specific enough, buyer 20 may identify additional product features as additional search criteria.

Detailed Description Text (14):
When GCD 42 has performed a search of the databases 32 identified by a pointer associated with a class that buyer 20 has selected, GCD 42 returns product data associated with one or more products that fit the search criteria. GCD 42 may integrate the product data resulting from the search into directory structure 44 so that the product data appears to buyer 20 as being part of GCD 42. GCD 42 may alternatively present the results of the search in any other appropriate manner. Each product resulting from the search may be an object which is unique instance of the class in which buyer 20 is searching. Each such object (and its location) may be uniquely identified using a numbering scheme corresponding to directory structure 44, as described below. As can be seen from the description above, GCD 42 provides the advantages of a global database without many of the disadvantages associated which such a global database. These advantages are realized since GCD 42 provides access to and presentation of global product data without actually storing all such data.

Detailed Description Text (16):
Although exemplary directory 44 may use industry standard schemas 46 as described above, any other appropriate number of schemas 62 may be used in addition to or instead of industry standard schemas 46. For example, while industry standard schemas 46 may be organized from a manufacturer's viewpoint, other schemas 62 may be used that organize products from a buyer's viewpoint. For example, a buyer 20 may wish to furnish a kitchen of a new house with various products, such as appliances, window treatments, paint, cabinetry, plumbing, dishes, and cooking utensils. Using one set of schemas 62, these products may be organized into a variety of unrelated classes based on certain features of the products (for example, certain kitchen appliances may be categorized in an electronics class 52 of directory structure 44 while paint may be categorized into an industrial class 52). However, another exemplary set of schemas 62 may categorize all such products into a home products class (which may include several classes further categorizing the products, such as a kitchen products class which includes a kitchen appliances class, which includes a refrigerator class, and so on). Therefore, the same product may be included in multiple schemas 62. These alternative schemas may be included in directory structure 44 and may be stored as a part of or separate from GCD 42.

Detailed Description Text (17):

In summary, a buyer 20 may search for a product using GCD 42 and thus eliminate or reduce the need for buyer 20 to search numerous sellers 30 to find the desired product. GCD 42 provides access to product data relating to these numerous products using directory structure 44, which organizes products using a hierarchical, object-oriented classification system. Buyer 20 may navigate or search directory structure 44 to find a particular classification of products and various information associated with the products within this classification, initiate a search of databases 32 including product data relating to a product, and then communicate with an appropriate database 32. This access to vast numbers of products is provided without the requirement that all data about the products be stored in a global database (which would greatly decrease performance). Instead the product data may be stored in seller databases 32 that can be readily accessed from the global content directory.

Detailed Description Text (18):
FIG. 3 illustrates an exemplary globally unique identifier (GUID) 100 that may be used to uniquely identify products that may be accessed using GCD 42. Directory structure 44 of GCD 42 provides a powerful tool for organizing and categorizing products. This organizational structure may also be used to identify products and product features using a GUID 100 that identifies the various classes into which a product is categorized. Furthermore, as described below, source information (such as information about a supplier or manufacturer) may also be included in a GUID 100 to identify a specific manufacturer, supplier, and/or other entity from which the specific product may be obtained.

Detailed Description Text (19):
The exemplary GUID 100 illustrated in FIG. 3 includes a class identifier (CID) 110 and a product identifier (PID) 120. CID 110 and PID 120 may be combined in any appropriate manner to form GUID 100. Exemplary CID 110 identifies the classes of GCD 42 into which a product identified by GUID 100 is categorized. The numbers identifying such classes are concatenated in order from a highest level class number 112a to a lowest level class number 112n. For example, class number 112a may identify a particular instance of GCD 42 (if there is more than one copy of GCD 42 or if GCD 42 is divided for load balancing) or may identify a set of schemas, such as industry standard schemas 46. Class number 112n may identify a class at the end of a branch of directory structure 44, such as felt-tip pen class 60b, or any other class which is a sub-class of the class or category identified by class number 112a. The class numbers 112 between class numbers 112a and 112n may then identify in succession the classes in directory structure 44 between the highest level class (identified by class number 112a) and the lowest level class (identified by class number 112n). In this case, each successive class number 112 identifies a sub-class of the class identified by the previous class number 112 in CID 110.

Detailed Description Text (20):
As an example only, the exemplary classes illustrated in directory structure 44 of FIG. 2 have been labeled with class numbers 112 in parenthesis to the right of the class name. Using these class numbers 112, exemplary CID 110 illustrates one technique for identifying felt-tip pen class 60b. In this example, the first class number 112a identifies GCD 42, the second class number 112b identifies industry standard schemas 46, the third class number 112c identifies indirect materials class 50, the fourth class number 112d identifies office and computer supplies class 52, the fifth class number 112e identifies desk supplies class 54, the sixth class number 112f identifies writing utensils class 56, the seventh class number 112g identifies pens class 58, and the eighth class number 112n identifies felt-tip pen class 60b.

Detailed Description Text (21):
As is illustrated, the various class numbers 112 are concatenated so that each previous class number 112 gives meaning to subsequent class numbers 112. In this example, the sub-classes directly under each class of directory structure 44 are

numbered starting at one (and ending at any appropriate number, indicated by "n"). Since multiple classes on the same level of directory structure 44 may have the same class number 112, such classes are uniquely identified by referring to the higher level classes in which the classes are included. For example, office and computer supplies class 52 is located on the same level as and has the same class number 112 as an electronics class 64; however, office and computer supplies class 52 may be uniquely identified by concatenating the class numbers 112 of industry standard schemas 46, indirect material class 50, and office and computer supplies class 52 to form a unique CID (in this case, "1.2.2"). This numbering scheme provides flexibility when adding and removing classes at any level. For example, another "pen type" class 60 may be added under pen class 58 and numbered without disrupting the numbering scheme of directory structure 44.

Detailed Description Text (22):
Although an exemplary numbering system has been introduced, the classes may be numbered using any appropriate technique. For example, each class above a particular level in directory structure 44 may have a unique class number 112 and each class below that particular level may be numbered as described above. Such a numbering system may be useful to reduce the length of a concatenated CID 110. For example, office and computer class 52 may have a unique number (as well as all classes at the same level or above), so that the "1.1.2.2" at the beginning of exemplary CID 110 may be replaced with this single number. Any other suitable numbering technique may also be used.

Detailed Description Text (23):
Exemplary GUID 100 also includes PID 120 which is used to uniquely identify a specific product that is included in the class identified by CID 110. Using the example above, PID 120 may identify a particular product in felt-tip pen class 60b. For example, PID 120 may identify a blue felt-tip pen having a medium tip and manufactured by a particular company. Therefore, since the classes of directory structure may not include all of the attributes of a particular product that may be needed to uniquely identify the product (for example, there are multiple types of felt-tip pens that may be included in felt-tip pen class 60b), PID 120 may be used to further identify a particular product in a class. Since each unique product in seller databases 32 may be an object of a class in GCD 42, PID 120 (combined with CID 110 to form GUID 100) can be used to uniquely identify any product included in databases 32.

Detailed Description Text (34):
In addition to providing a method of identifying products located using GCD 42, a GUID 100 may also be used in the physical world to identify products. Similarly, an RID may be used to identify the source of a particular product. Therefore, a GUID 100 may be used to replace a universal product code (UPC) that currently is used to identify a product. Unlike a UPC, however, a GUID 100 provides a much more flexible numbering scheme (for example, it may be expanded to accommodate the addition of an unlimited number of classes at any level in directory structure 44) and provides a definition of certain attributes of a product through its connection to the object-oriented class hierarchy of GCD 42. An RID may also be associated with (or be included in GUID 100) to provide the identity of the source of the product. Therefore, if a buyer 20 desires to purchase a product having a GUID 100 and RID, the GUID 100 and RID may be scanned or entered into a computer coupled to e-commerce system 10 (or coupled to sellers 30) to initiate a purchase of the product. For example, if a buyer 20 runs out of milk, buyer 20 may scan or enter in the GUID 100 and RID located on the empty milk jug and also enter in a unique identifier of the buyer 20. Based on the RID, the product request may be directed to the appropriate seller 30 and the seller may use a buyer identifier to charge buyer 20 for another milk jug and to ship the milk jug to the buyer 20. Any appropriate systems may be implemented to perform the functions necessary to complete such a transaction. A buyer 20 may also communicate a GUID 100 to GCD 42 to determine the RID of and/or other information about one or more sellers 30 that

supply the product with the GUID 100. A GUID 100 and/or an RID also may be used in numerous other ways to streamline business transactions.

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